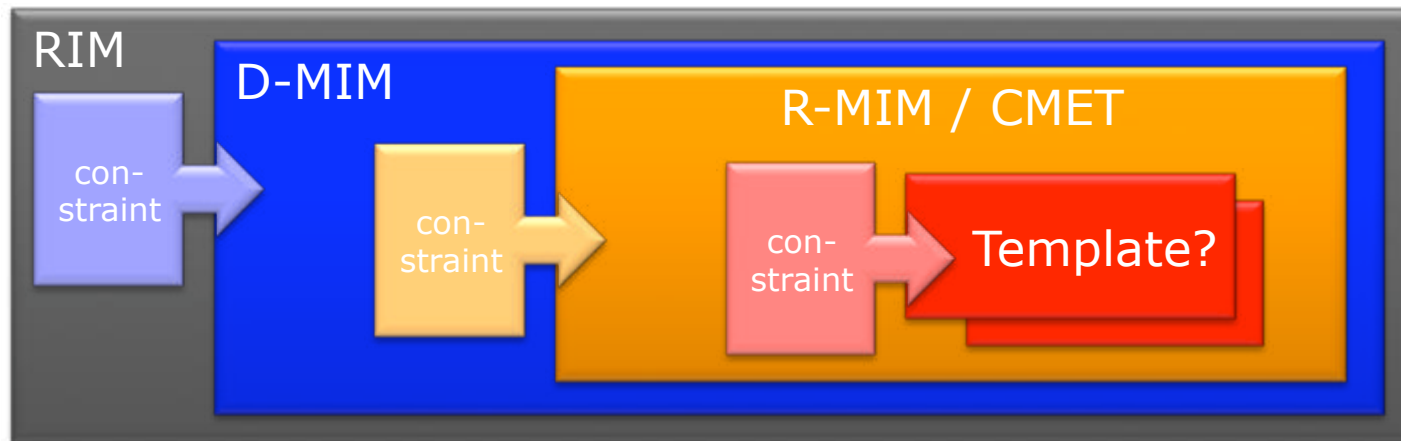Nictiz

Templates
– A Dutch approach

Kai U. Heitmann
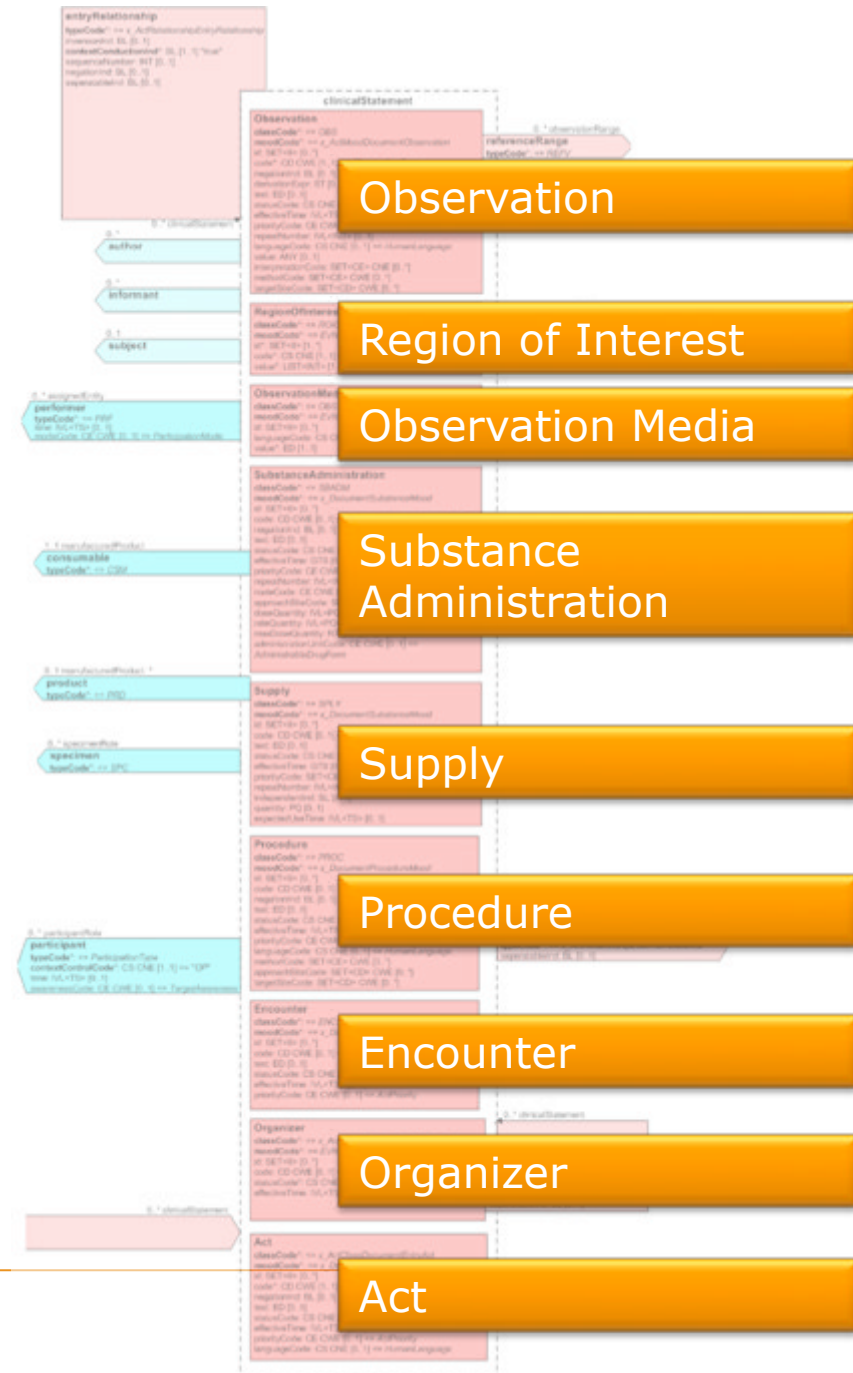
October 2010

The challenge

- **HL7 Models**

- **Data Set Mapping**
  - Medical – Model – Content
- **Support for interface specialists**

The challenge

- Generic HL7 Models: e. g. Clinical Statement

Observation

Region of Interest

Observation Media

Substance Administration

Supply

Procedure

Encounter

Organizer

Act

Part of the problem

- **Expression of constraints**
  - Model
    - +

      Visually equal to R-MIM

      Applied RIM rules

      MIF based
    - −

      You need a model for every "thing"

      Leads to variants in XML instances

      How to deal with additional rules(business rules) and dependencies between items?

> *Example Perinatologie:*
>
> If there is more than one **fetus** (twins etc.) information about **chorionicity** and **amnionicity** is required…
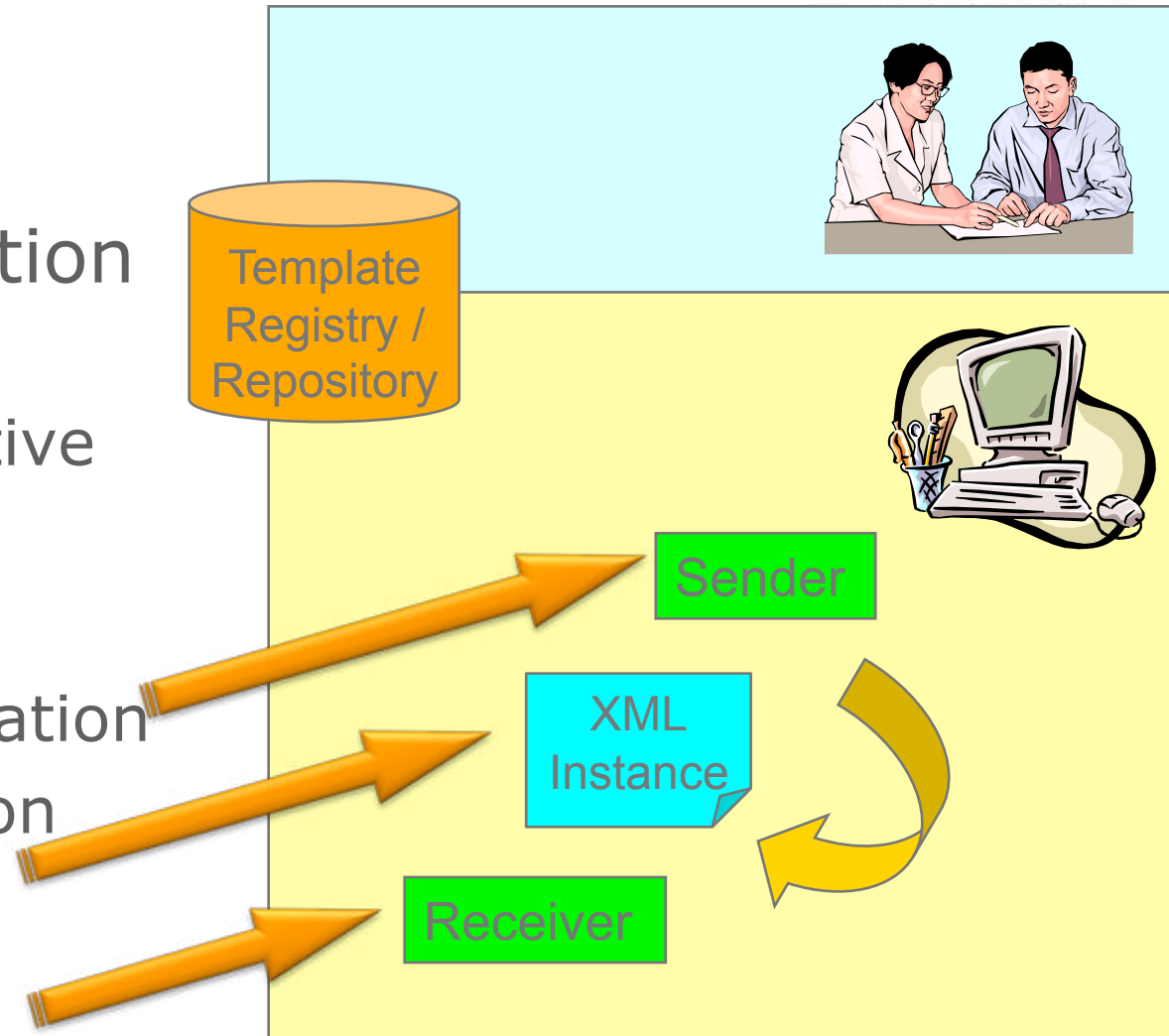
Part of the problem

- „Languages" for constraints
  - Text (implementation guides)
  - (Basic) Data Set
  - Value Sets

  - Templates DSTU
  - Detailed Clinical Models (DCM)
  - Schematron

The challenge

- **Templates**
  - Documentation of artefacts
    - text/narrative
  - Support
    - Interface implementation
    - Instantiation
    - Validation
    - Processing

Template Registry / Repository

Sender

XML Instance

Receiver

Templates

- *" ... future implementation guides will be a collection of templates, stored in a template registry"*

  – Liora Alschuler, co-author CDA

Types of constraints

- Structures
- II's
- Use of OID's
- Code systems and value sets
- Cardinalities
- Data types
- Units
- Precision

- Instance conformance (M, R, O, X, NP etc.)
- Minimum en maximum values
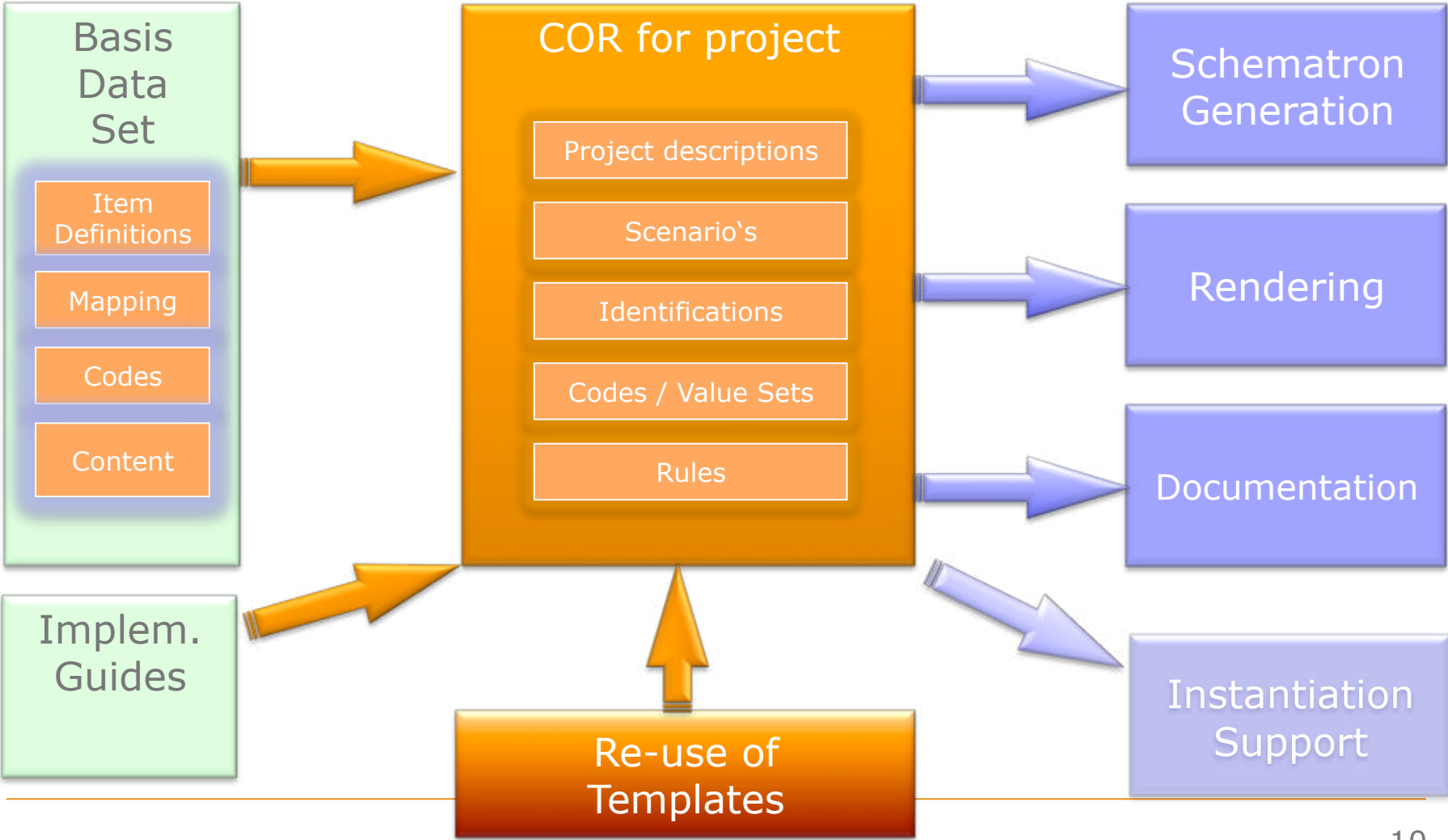- Dependencies between items (business rules)
- …

COR = codes, OIDs, rules

- Definition of a template language
- Standards as a basis:
  - Templates DSTU (HL7)
  - ISO schematron validation
  - XSLT, Xpath, ..., HTML, Ajax
  - Sharing value sets (IHE profile)
  - OID registry structures
    - ISO 13582 "Object Identifier Repository Export Format"
  - MIF data type / structure definitions
  - ...

COR

Nictiz
Betere zorg door betere informatie

Basis Data Set
- Item Definitions
- Mapping
- Codes
- Content

Implem. Guides

COR for project
- Project descriptions
- Scenario's
- Identifications
- Codes / Value Sets
- Rules

Re-use of Templates

Schematron Generation

Rendering

Documentation

Instantiation Support

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Codes / Value Sets

COR Information Project: Perinatologie (peri-)

| Project Information | Scenarios | Identifiers | Codes / Value sets | Rules |

Codes / Value sets

AUSFindings (value set)

ActConsentType (value set)

AdministrativeGender (value set)

Amnioniciteit (value set)

Code	Code System	Display Name	Level Type
1	2.16.840.1.113883.2.4.4.13.29	monoamniotisch	leaf
2	2.16.840.1.113883.2.4.4.13.29	diamniotisch	leaf

AmniotomieMoment (value set)

AndereZorgverlenerBetrokken (value set)

Rules

COR Information Project: Perinatologie (peri-)

| Project Information | Scenarios | Identifiers | Codes / Value sets | Rules |

Rules

Rule TMP	Discription	Scenarios
peri-intii-s	Interaction Id (WRAPPER)	startzorgf1b

Rule TMP	Discription	Scenarios
peri-intii-up	Interaction Id (WRAPPER)	uitkomstf1b postnatalezorgf1b counselingf1b indpdf1b

peri-intii-up	uitkomstf1b postnatalezorgf1b counselingf1b indpdf1b	Interaction Id (WRAPPER)
Context	**h17:REPC_IN004211UV01**	
Description	Interaction ID for Append Care Provision	
Elements		

Element	**h17:interactionId**	
Cardinality	1 .. 1 mandatory	
Where	@root shall be	2.16.840.1.113883.1.6
Where	@extension shall be	REPC_IN004211UV01

Rule TMP	Discription	Scenarios
peri-intii-e	Interaction Id (WRAPPER)	eindezorgf1b

Instance & Template

- ## Instance

```xml
<pertinentInformation3 typeCode="PERT" contextConductionInd="true">
  <observation classCode="OBS" moodCode="EVN">
    <!-- Chorioniciteit -->
    <id root="2.16.840.1.113883.2.4.99.23444.112" extension="a5462"/>
    <code code="Chorionic" codeSystem="2.16.840.1.113883.2.4.4.13"/>
    <value xsi:type="CE" code="1" codeSystem="2.16.840.1.113883.2.4.4.13.30"/>
  </observation>
</pertinentInformation3>
```

- ## Template

```xml
<!-- Item: 20140 - Chorioniciteit 0..1 C 0012 -->
<element name="hl7:pertinentInformation3" minimumMultiplicity="0"
         maximumMultiplicity="1" contains="chorioniciteit">
   <attribute typeCode="PERT" contextConductionInd="true"/>
</element>
```

Instance & Template

```xml
<rule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="../../../XMLdevelop/COR.xsd">

    <!-- Item: 20140 - Chorioniciteit C0012 -->

    <element name="hl7:observation">
        <example>
            <observation classCode="OBS" moodCode="EVN">
                <!-- Chorioniciteit -->
                <id root="2.16.840.1.113883.2.4.99.23444.112" extension="a5462"/>
                <code code="Chorionic" codeSystem="2.16.840.1.113883.2.4.4.13"/>
                <value xsi:type="CE" code="1" codeSystem="2.16.840.1.113883.2.4.4.13.30"/>
            </observation>
        </example>
        <item ref="20140" description="Chorioniciteit"/>
        <attribute classCode="OBS" moodCode="EVN"/>
        <element name="hl7:code" minimumMultiplicity="1" maximumMultiplicity="1"
                isMandatory="true">
            <attribute code="Chorionic" codeSystem="2.16.840.1.113883.2.4.4.13"/>
        </element>
        <element name="hl7:value" minimumMultiplicity="1" maximumMultiplicity="1">
            <attribute datatype="CE" fromValueSet="Chorioniciteit"/>
        </element>
    </element>

</rule>
```

Example(s)
Descriptions

Orientation

Attributes /
Elements

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Instance & Template

Element	**hl7:pertinentInformation3** where *[hl7:observation[hl7:code[@code='Chorionic'][@codeSystem='2.16.840.1.113883.2.4.4.13']]]*	
Cardinality	0 .. 1	
Where	@typeCode shall be	PERT
Contains	inherited ruleset *chorioniciteit* with overridden cardinality 0 .. 1	
Elements		

Element	**hl7:observation**	Chorioniciteit (20140)
Cardinality	1 .. 1	

Example	```xml
	<observation classCode="OBS" moodCode="EVN" >
	
	  <!-- Chorioniciteit -->
	
	  <id root="2.16.840.1.113883.2.4.99.23444.112" extension="a5462" />
	
	  <code code="Chorionic" codeSystem="2.16.840.1.113883.2.4.4.13" />
	
	  <value xsi:type="CE" code="1" codeSystem="2.16.840.1.113883.2.4.4.13.30" />
	
	</observation>
	``	

Where	@classCode shall be	OBS
Where	@moodCode shall be	EVN
Elements		

Element	**hl7:code**	
Cardinality	1 .. 1 mandatory	
Where	@code shall be	Chorionic
Where	@codeSystem shall be	2.16.840.1.113883.2.4.4.13

Element	**hl7:value**	
Cardinality	1 .. 1	
Where	data type is	CE
Where	@code shall be drawn from value set	*Chorioniciteit*